

VAV INTERNATIONAL INC.

Consulting Mechanical Engineers

Date: 10/08/14

By: Frank Stramaglia

**PROJECT: Tolles Parsons Center
Domestic Water Service Calcs**

FIXTURE	QTY.	FIXTURE UNITS EACH (248 CMR, 10.14 TABLE 1)		FIXTURE UNITS EXTENDED	
		CW	HW	CW	HW
Water Closet	9	12	0	108	0
Lavatory	10	1	1	10	10
Urinal	3	6	0	18	0
Janitor Sink	2	2	2	4	4
Drinking Fountain	2	1	0	2	0
kitchen Sink	5	2	2	10	10
DISHWASHER	1	0	2	0	2
Pot Sink	1	6	6	6	6
HOSE BIBBS	4	2	0	8	0
WALL HYDRANTS	2	2	0	4	0
		<u>Sub Total</u>		170	32
		<u>Total FU</u>		202	

Demand Factor For Assembly
(248 CMR, 10.14 Table 2)

X

0.6

Capacity Factor

121.2 = 2-1/2"

10.14 Table 3

1" = 9.1 to 16.5 FU

1-1/4" = 16.6 to 28 FU

1-1/2" = 28.1 to 55 FU

2" = 55.1 to 107.5 FU

2-1/2" = 107.6 to 182.5 FU

3" = 182.6 to 287.5 FU

3-1/2" = 287.6 to 425 FU

4" = 425.1 to 700

Meter Size = 2"

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PROJECT: **Tolles Parson Center**
Sanitary Sewer Service Calcs

FIXTURE	QTY.	FIXTURE UNITS EACH	FIXTURE UNITS EXTENDED
		W	W
Water Closets (Flush Valves)	9	6	54
Water Closets (Tank Type)	0	6	0
Lavatory	10	2	20
Urinal	3	6	18
2" Floor Drain	0	3	0
3" Floor Drain	4	5	20
Kitchen Sink	5	3	15
Pot Sink	1	12	12
Dishwasher	1	6	6
Drinking Fountain	2	0.5	1
Janitor Sink	2	3	6
		Total	152

Capacity Factor**152 = 4"**

**TABLE 2: MAXIMUM LOADS IN
 FIXTURE UNITS FOR
 HORIZONTAL DRAINS (F.U.)**

Diameter of drain (inches)	Horizontal fixture branch1 (F.U.)
4	180
5	390
6	700
8	1,600
10	2,900
12	4,600
15	8,300

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10/8/14
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PROJECT: **Tolles Parsons Center**
 Water and Sanitary Sewer Usage

Total Water: Water GPD would be 2,968

Total Sewer: Waste Gallons per day would be 2,375

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This memo will serve as confirmation that we have taken into consideration 780 CMR, 8th Edition, Section, 903.1.1 with regard to the design of the automatic fire sprinkler system and compliance with applicable codes at the above referenced location.

Re: 780 CMR 903.1.1, item 1:

(1.a) Basis (Methodology) of Design

Section 1 - Building Description

- a. Building "Use" Group – A-3 (Assembly) & B (Business)
- b. Total square footage - 12,894 gross sq. ft.
- c. Building height - 38 feet
- d. Number of floors above grade - 2
- e. Number of floors below grade - 0
- f. Type of occupancies within the building – Cafe, Function Hall, Office areas
- g. Type of construction - Wood frame (combustible)
- i. Hazardous material usage and storage - N/A
- j. High storage of commodities over 12-feet - N/A
- k. Site access for emergency vehicles - Access to the site is gained from Washington ST. Building is Fully Accessible.

Section 2 – Applicable Laws, Regulations and Standards

- a. City of Wellesley Regulations.
- b. CMR 780, Commonwealth of Massachusetts Regulations (State Building Code), 8th Edition
- c. NFPA-13, 2013 Edition, "Installation of Sprinkler Systems"
- d. NFPA-14, "Installation of Standpipe and Hose Systems"
- e. NFPA-10, "Portable Fire Extinguishers"
- f. NFPA-24, "Private Fire Service Mains and their Appurtenances"
- g. NFPA-72, "National Fire Alarm Code"
- h. NFPA-25, 2002 Edition, "Inspection, Testing and Maintenance of Water-Based Fire Protection Systems"
- i. M.G.L. Chapter 146, Section 81 through 89 and CMR 528, Section 11 and 12, (Sprinkler Contractor and Fitters Licensing Laws and Regulations).
- j. M.G.L. Chapter 148, Section 26G (Buildings or Additions; Automatic Suppressant or Sprinkler Systems)

Section 3 - Design Responsibility for Fire Protection Systems

- a. The Professional Engineer(s) (PE) fully designs and specify (develop a full system layout, design criteria and calculations), reviews and approves the installing

contractors shop drawings and certifies the system installation for code compliance at completion.

Section 4 - Fire Protection Systems to Be Installed

- a. Fire mains and hydrants - An new 4-inch fire service will be provided to the building with 4" double check valve assembly located in mechanical room.
- b. Automatic sprinkler system and components - A sprinkler system for this project will comply with NFPA-13, 2013 edition. A wet-pipe system will be used to protect all areas of the building except for the attic which will be served by a dry system.
- c. Standpipe system - N/A
- d. Fire department connections, and fire alarm interface as required.
- e. Fire alarm system and components - (refer to fire alarm narrative)
- f. Automatic fire extinguishing systems - N/A
- g. Manual suppression systems - Fire extinguishers per the requirements of NFPA-10.
- h. Smoke control/management systems - N/A
- i. Kitchen cooking equipment and exhaust systems - Kitchen Hood will be supplied with ansul system.
- j. Hazardous material monitoring equipment - N/A
- k. Piping - Wet sprinkler piping and standpipes shall be black steel Schedule 10 and/or 40 with screwed or mechanical grooved fittings.

Section 5 - Features used in design methodology

- a. Building occupant notification and evacuation procedures-

Audiovisual alarm notification appliance devices will be provided where indicated on fire alarm drawings and shall be automatically activated by smoke detectors, heat detectors, sprinkler water flow devices or manual fire alarm boxes.

- b. Emergency response personal, site and system features-

New fire department connection is located on the front side of the building. A municipal hydrant will be located on the site in a parking island at the front of the building. Sprinkler riser station will be located in the mechanical room.

- c. Safeguards, fire prevention and emergency procedures during construction-

Fire extinguishers shall be placed in unprotected areas.

- d. Method for future testing and maintenance of systems and documentation-

The owners will be responsible for enlisting the services of a UL listed central station company for testing and repairs to the fire alarm system and a licensed sprinkler contractor for testing and repairs in accordance with the requirements of NFPA-25 for all items relating to water supply and automatic sprinkler systems.

Section 6 – Special Consideration and Description

a. N/A

(1.b) Sequence of Operation

Section 1

- a. A wet pipe system protects the entire building. Thermally sensitive automatic sprinklers connected to fixed fire protection piping system filled with pressurized water from the public water supply are used in detecting a fire. When a fire occurs, the heat produced will fuse and operate sprinklers over the affected area distributing water to control or extinguish the fire. As water flows through the system, a paddle type water flow alarm device is activated, which in turn initiates the Fire Alarm System.
- b. Refer to Fire Alarm Narrative for complete “sequence of operation”.
- c. All control, drain and test connections shall be provided with signs indicating their purpose. Sectional control valves shall have a sign indicating the portion of the system that is controlled by the valve.

(1.c) Testing Criteria

Section 1 - Testing Criteria

- a. The Fire Protection Contractor shall be responsible for coordinating the final acceptance testing, which shall be witnessed by the head of the fire department or his designee.
- b. The contractor shall also be responsible for insuring, and attest in writing that all equipment and devices have been tested as an entire system where such devices are integrated with the Fire Alarm System.
- c. The Contractor will provide notification in writing to all code officials and public utility companies and personnel as to the specific dates and times to perform all required testing as a system or individual component testing.

Section 3 - Equipment and Tools

- a. All above ground piping shall be hydrostatically tested per the requirements of NFPA-13 at 200 psi or 50 psi in excess of normal static pressure for 2-hours without loss of pressure utilizing a hydrostatic test pump. The amount of leakage in buried pipe shall be measured at the specified test pressure by pumping from a calibrated container.
- b. All control valves shall be fully closed and opened under system water pressure to ensure proper operation.
- c. Supervisory tamper switches shall be tested for proper operation by closing the control valve and verifying signal at fire alarm control panel.
- d. A main drain test shall be performed per the requirements of NFPA-13, by observing

- and recording the supply pressure gauge reading and then opening the main drain fully and again observing and recording the supply pressure gauge reading.
- e. The water flow detecting devices and associated alarm circuits shall be flow tested by opening the inspectors test connection, and shall result in an audible alarm on the premises and activation of the Fire Alarm System within 60 seconds.

Approval Requirements

- a. Written approval is required by Wellesley Fire Department that the systems satisfy all operational code compliance requirements.
- b. When a portion of the system fails to operate satisfactorily, that portion shall be corrected and pre-tested prior to rescheduling final acceptance test.
- c. Properly executed Material, Test, Performance and Completion Certificates will be provided by the installing contractor.